

## CLAIMS

We claim:

1. A computerized method for tracing the association of components consumed in  
5 production of printed circuit board assemblies, the method comprising steps of:
  - (a) receiving an indication of a failure of a first printed circuit board assembly,  
the first printed circuit board assembly having a first unique identification  
number;
  - 10 (b) receiving an indication of a failed component of the first printed circuit board  
assembly, the failed component being a member of a plurality of substantially  
similar components that were used in the manufacture of a plurality of printed  
circuit board assemblies;
  - (c) determining a second unique identification number of a second printed circuit  
board assembly that comprises a failed component of the plurality of  
15 substantially similar components; and
  - (d) communicating the second unique identification number to an entity  
associated with possession of the second printed circuit board assembly.
2. The computerized method of claim 1, wherein the receiving step (b) is performed  
20 before the receiving step (a).
3. The computerized method of claim 1, wherein the plurality of substantially  
similar components further comprise a reel of components.
- 25 4. The computerized method of claim 1, wherein the method further comprises the  
step of:
  - (e) determining a causation of the failure of the first printed circuit board  
assembly, the causation being associated with a source selected from the  
group consisting of a vendor of the failed component, a manufacturer of

the failed component, and a process of manufacturing the printed circuit board assembly.

5        5.        The computerized method of claim 1, wherein the determining step (c) further comprises:

          (c)(1) determining a plurality of unique identification numbers of the members of the plurality of printed circuit board assemblies, other than the failed printed circuit board assembly, that comprises a failed component of the plurality of substantially similar components; and

10        wherein the communicating step (d) further comprises:

          (d)(1) communicating the plurality of unique identification numbers to at least one entity associated with possession of the second printed circuit board assembly.

15        6.        The computerized method of claim 1, wherein an entity associated with possession further comprises a downstream member of a marketing channel.

20        7.        The computerized method of claim 1, further comprising the steps of:

          (e) capturing an identification of the plurality of substantially similar components;

          (f) capturing the first unique identification number of the first printed circuit board assembly;

25        (g) associating the identification of the plurality of substantially similar components with the first unique identification number of the first printed circuit board assembly;

          (h) capturing the second unique identification number of the second printed circuit board assembly; and

(i) associating the identification of the plurality of substantially similar components with the second unique identification number of the second printed circuit board assembly;

wherein the capturing step (f) and the capturing step (g) are performed during a production of the first printed circuit board assembly and the associating step (h) and the capturing step (i) are performed during a production of the second printed circuit board assembly.

8. The computerized method of claim 7, wherein the identification of the plurality of substantially similar components further comprises a trace code of the plurality of substantially similar components, a lot code of the plurality of substantially similar components, a vendor of the plurality of substantially similar components, a production date, a date after which the printed circuit board assembly identification is produced, and a date before which the printed circuit board assembly identification is produced.

9. The computerized method of claim 7, wherein the capturing step (f) further comprises a step of:

(f)(1) scanning a bar code of a reel of components.

10. The computerized method of claim 7, wherein the capturing step (f) is performed before the capturing step (g).

11. A computerized apparatus for tracing the association of components consumed in production of printed circuit board assemblies, the apparatus comprising:

a first receiver of an indication of a failure of a first printed circuit board assembly, the first printed circuit board assembly having a first unique bar-coded identification number;

a second receiver of an indication of a failed component of the first printed circuit board assembly, the failed component being a member of a plurality of

substantially similar components that were used in the manufacture of a plurality of printed circuit board assemblies, the second receiver operably coupled to the first receiver;

5 a first determiner of a second unique bar-coded identification number of a second printed circuit board assembly that comprises a failed component of the plurality of substantially similar components, the first determiner operably coupled to the second receiver; and

10 a first communicator of the second unique bar-coded identification number to an entity associated with possession of the second printed circuit board assembly, the first communicator operably coupled to the first determiner.

12. The computerized apparatus of claim 11, wherein the plurality of substantially similar components further comprises a reel of components.

15 13. The computerized apparatus of claim 11, wherein the apparatus further comprises: a second determiner of a causation of the failure of the first printed circuit board assembly, the causation being associated with a source selected from the group consisting of a vendor of the failed component, a manufacturer of the failed component, and a process of manufacturing the printed circuit  
20 board assembly, the second determiner operably coupled to the first determiner.

14. The computerized apparatus of claim 11, further comprising:  
25 a first capturer of an identification of the plurality of substantially similar components;  
a second capturer of the first unique identification number of the first printed circuit board assembly;

a determiner of an association of the identification of the plurality of substantially similar components with the first unique identification number of the first printed circuit board assembly;

a capturer of the second unique identification number of the second printed circuit board assembly; and

an associator of the identification of the plurality of substantially similar components with the second unique identification number of the second printed circuit board assembly.

10 15. The computerized apparatus of claim 14, wherein the identification of the plurality of substantially similar components further comprises a trace code of the plurality of substantially similar components, a lot code of the plurality of substantially similar components, a vendor of the plurality of substantially similar components, a production date, a date after which the printed circuit board assembly identification is  
15 produced, and a date before which the printed circuit board assembly bar-coded identification is produced.

20 16. The computerized apparatus of claim 14, wherein the first capturer further comprises a scanner of a bar code of a reel of components.

25 17. The computerized apparatus of claim 11, wherein the first determiner further comprises:

a second determiner of a plurality of unique bar-coded identification numbers of the members of the plurality of printed circuit board assemblies, other than the failed printed circuit board assembly, that comprises a failed component of the plurality of substantially similar components.

18. The computerized apparatus of claim 17, wherein an entity associated with possession further comprises a downstream member of a marketing channel.

19. The computerized apparatus of claim 11, wherein the first communicator further comprises:

- 5           a second communicator of the plurality of unique bar-coded identification numbers to at least one entity associated with possession of the second printed circuit board assembly.

20. A system for associating tracing failed components in printed circuit board assemblies comprising:

- 10           a processor;  
          a storage device coupled to the processor;  
          software means operative on the processor for tracing the association of components consumed in production of a plurality of printed circuit board assemblies through a group of substantially similar components embodied on a reel; wherein the printed circuit boards  
15           are determined to be associated from a bar-coded identification code on each of the plurality of printed circuit board assemblies and from a bar-coded identification code on the group of substantially similar components embodied on a reel.

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